



## Complete Summary

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### GUIDELINE TITLE

Recommended childhood and adolescent immunization schedule - United States, July-December 2004.

### BIBLIOGRAPHIC SOURCE(S)

Centers for Disease Control and Prevention. Recommended childhood and adolescent immunization schedule - United States, July-December 2004. MMWR Morb Mortal Wkly Rep 2004 Apr 30;53(16):Q1-4. [3 references]

Recommended childhood and adolescent immunization schedule--United States, July-December 2004. Pediatrics 2004 May; 113(5): 1448. [PubMed](#)

## COMPLETE SUMMARY CONTENT

SCOPE

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IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

## SCOPE

### DISEASE/CONDITION(S)

Vaccine-preventable diseases:

- Diphtheria
- Hepatitis A and B
- Haemophilus influenzae infection
- Influenza
- Measles
- Mumps
- Pertussis
- Pneumococcal infection
- Polio
- Rubella
- Tetanus
- Varicella (chickenpox)

## GUIDELINE CATEGORY

Prevention

## CLINICAL SPECIALTY

Family Practice  
Infectious Diseases  
Pediatrics  
Preventive Medicine

## INTENDED USERS

Advanced Practice Nurses  
Health Care Providers  
Nurses  
Physician Assistants  
Physicians  
Public Health Departments

## GUIDELINE OBJECTIVE(S)

- To ensure that the recommended childhood and adolescent immunization schedule is current with changes in manufacturers' vaccine formulations
- To reflect revised recommendations for the use of licensed vaccines, including those newly licensed

## TARGET POPULATION

Children and adolescents residing in the United States

## INTERVENTIONS AND PRACTICES CONSIDERED

Immunization with the following vaccines:

1. Diphtheria and tetanus toxoids and acellular pertussis vaccine (Td/DTaP)
2. Haemophilus influenzae type b (Hib) conjugate
3. Hepatitis A and B (Hep A and Hep B)
4. Inactivated polio virus (IPV)
5. Influenza
  - Intramuscular trivalent inactivated influenza vaccine (TIV)
  - Live-attenuated influenza vaccine (LAIV)
6. Measles, mumps and rubella (MMR)
7. Pneumococcus
  - Pneumococcal conjugate vaccine (PCV)
  - Pneumococcal polysaccharide vaccine (PPV)
8. Varicella vaccine (VAR)

## MAJOR OUTCOMES CONSIDERED

Not stated

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

### METHOD OF GUIDELINE VALIDATION

Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The updated guideline recommendations and format were approved by the Advisory Committee on Immunization Practices, the American Academy of Family Physicians, and the American Academy of Pediatrics.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Note: The guideline recommendations are presented in the form of tables with footnotes (see below).

#### Catch-Up Childhood and Adolescent Immunization Schedule

A catch-up immunization schedule for children and adolescents who start late or who are >1 month behind remains the same (see table below). Minimum ages and minimum intervals between doses are provided for each of the routinely recommended childhood and adolescent vaccines. The schedule is divided into two age groups: children aged 4 months to 6 years and children/adolescents aged 7 to 18 years.

#### Influenza Vaccine

The Advisory Committee on Immunization Practices (ACIP) recommends that beginning in fall 2004, children aged 6 to 23 months, as well as household and out-of-home caregivers for such children, receive annual influenza vaccine.

#### Vaccine Information Statements

The National Childhood Vaccine Injury Act requires that all health-care providers give parents or patients copies of Vaccine Information Statements before administering each dose of the vaccines listed in the schedule. Additional information is available from state health departments and at [www.cdc.gov/nip/publications/vis](http://www.cdc.gov/nip/publications/vis). Detailed recommendations for using vaccines are available from the manufacturers' package inserts, ACIP statements on specific vaccines, and the 2003 Red Book. ACIP statements for each recommended childhood vaccine can be viewed, downloaded, and printed from the Centers for Disease Control and Prevention's National Immunization Program Web site at [www.cdc.gov/nip/publications/acip-list.htm](http://www.cdc.gov/nip/publications/acip-list.htm). Instructions on the use of the Vaccine Information Statements are available at [www.cdc.gov/nip/publications/vis/vis-instructions.pdf](http://www.cdc.gov/nip/publications/vis/vis-instructions.pdf). In addition, guidance on how to obtain and complete a Vaccine Adverse Event Reporting System (VAERS) form is available at [www.vaers.org](http://www.vaers.org) or by telephone, 800-822-7967.

Recommended childhood and adolescent immunization schedule<sup>1</sup> --  
United States, July-December 2004

|         | Range of recommended ages |      |      |      | *Catch-up vaccination |       |       |       | Preadolescent assessment |       |         |         |
|---------|---------------------------|------|------|------|-----------------------|-------|-------|-------|--------------------------|-------|---------|---------|
| Vaccine | Birth                     | 1 mo | 2 mo | 4 mo | 6 mo                  | 12 mo | 15 mo | 18 mo | 24 mo                    | 4–6 y | 11–12 y | 13–18 y |

|   |         |                           |      |      |                    |           |      |  |                    |        |         |     |
|---|---------|---------------------------|------|------|--------------------|-----------|------|--|--------------------|--------|---------|-----|
| Hepatitis B <sup>2</sup>                              | HepB #1 | *only if mother HBsAg (-) |      |      |                    |           |      |  | *HepB series       |        |         |     |
|   |         | HepB #2                   |      |      | HepB #3            |           |      |  |                    |        |         |     |
| Diphtheria, Tetanus, Pertussis <sup>3</sup>           |         |                           | DTaP | DTaP | DTaP               |           | DTaP |  |                    | DTaP   | Td      | *Td |
| Haemophilus influenzae type b <sup>4</sup>            |         |                           | Hib  | Hib  | Hib <sup>4</sup>   | Hib       |      |  |                    |        |         |     |
| Inactivated Polio                                     |         |                           | IPV  | IPV  | IPV                |           |      |  |                    | IPV    |         |     |
| Measles, Mumps, Rubella <sup>5</sup>                  |         |                           |      |      |                    | MMR #1    |      |  |                    | MMR #2 | *MMR #2 |     |
| Varicella <sup>6</sup>                                |         |                           |      |      |                    | Varicella |      |  | *Varicella         |        |         |     |
| Pneumococcal <sup>7</sup>                             |         |                           | PCV  | PCV  | PCV                | PCV       |      |  |                    |        |         |     |
| Influenza <sup>8</sup>                                |         |                           |      |      | Influenza (yearly) |           |      |  |                    |        |         |     |
| Vaccines below this line are for selected populations |         |                           |      |      |                    |           |      |  |                    |        |         |     |
| Pneumococcal <sup>7</sup>                             |         |                           |      |      |                    |           |      |  | *PCV               |        |         |     |
|   |         |                           |      |      |                    |           |      |  | PPV                |        |         |     |
| Influenza <sup>8</sup>                                |         |                           |      |      |                    |           |      |  | Influenza (yearly) |        |         |     |
| Hepatitis A <sup>9</sup>                              |         |                           |      |      |                    |           |      |  | HepA series        |        |         |     |

1. Indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of April 1, 2004, for children through age 18 years. Any dose not given at the recommended age should be given at any subsequent visit when indicated and feasible. Green shaded regions of the table (also indicated by an \*) indicate age groups that warrant special effort to administer those vaccines not given previously. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and the vaccine's other components are not contraindicated. Providers should consult the manufacturers' package inserts for detailed recommendations. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at [www.vaers.org](http://www.vaers.org) or by telephone, 800-822-7967.
2. Hepatitis B vaccine (HepB): All infants should receive the first dose of HepB vaccine soon after birth and before hospital discharge; the first dose also may be given by age 2 months if the infant's mother is HBsAg-negative. Only monovalent HepB vaccine can be used for the birth dose. Monovalent or combination vaccine containing HepB may be used to complete the series; 4 doses of vaccine may be administered when a birth dose is given. The second dose should be given at least 4 weeks after the first dose except for combination vaccines, which cannot be administered before age 6 weeks. The third dose should be given at least 16 weeks after the first dose and at least 8 weeks after the second dose. The last dose in the vaccination series (third or

fourth dose) should not be administered before age 24 weeks. Infants born to HBsAg-positive mothers should receive HepB vaccine and 0.5 mL hepatitis B immune globulin (HBIG) within 12 hours of birth at separate sites. The second dose is recommended at age 1–2 months. The last dose in the vaccination series should not be administered before age 24 weeks. These infants should be tested for HBsAg and anti-HBs at age 9–15 months. Infants born to mothers whose HBsAg status is unknown should receive the first dose of the HepB vaccine series within 12 hours of birth. Maternal blood should be drawn as soon as possible to determine the mother's HBsAg status; if the HBsAg test is positive, the infant should receive HBIG as soon as possible (no later than age 1 week). The second dose is recommended at age 1–2 months. The last dose in the vaccination series should not be administered before age 24 weeks.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP): The fourth dose of DTaP may be administered at age 12 months provided that 6 months have elapsed since the third dose and the child is unlikely to return at age 15–18 months. The final dose in the series should be given at age  $\geq 4$  years. Tetanus and diphtheria toxoids (Td) is recommended at age 11–12 years if at least 5 years have elapsed since the last dose of tetanus and diphtheria toxoid-containing vaccine. Subsequent routine Td boosters are recommended every 10 years.
4. Haemophilus influenzae type b (Hib) conjugate vaccine: Three Hib conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB® or ComVax® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required. DTaP/Hib combination products should not be used for primary vaccination in infants at ages 2, 4, or 6 months but can be used as boosters after any Hib vaccine. The final dose in the series should be given at age  $\geq 12$  months.
5. Measles, mumps, and rubella vaccine (MMR): The second dose of MMR is recommended routinely at age 4–6 years but may be administered during any visit provided that at least 4 weeks have elapsed since the first dose and that both doses are administered beginning at or after age 12 months. Those who have not received the second dose previously should complete the schedule by the visit at age 11–12 years.
6. Varicella vaccine (VAR): Varicella vaccine is recommended at any visit at or after age 12 months for susceptible children (i.e., those who lack a reliable history of chickenpox). Susceptible persons aged  $\geq 13$  years should receive 2 doses given at least 4 weeks apart.
7. Pneumococcal vaccine: The heptavalent pneumococcal conjugate vaccine (PCV) is recommended for all children aged 2–23 months and for certain children aged 24–59 months. The final dose in the series should be given at age  $\geq 12$  months. Pneumococcal polysaccharide vaccine (PPV) is recommended in addition to PCV for certain high-risk groups (see the National Guideline Clearinghouse [NGC] summary [Preventing pneumococcal disease among infants and young children. Recommendations of the Advisory Committee on Immunization Practices \[ACIP\]](#)).
8. Influenza vaccine: Influenza vaccine is recommended annually for children aged  $\geq 6$  months with certain risk factors (including but not limited to asthma, cardiac disease, sickle cell disease, HIV, and diabetes), health care workers, and other persons (including household members) in close contact with persons in groups at high risk, and can be administered to all others wishing to obtain immunity. In addition, healthy children aged 6–23 months and close contacts of healthy children aged 0–23 months are recommended to receive

influenza vaccine because children in this age group are at substantially increased risk for influenza-related hospitalizations. For healthy persons aged 5–49 years, the intranasally administered live attenuated influenza vaccine (LAIV) is an acceptable alternative to the intramuscular trivalent inactivated influenza vaccine (TIV) (see the NGC summary [Using live, attenuated influenza vaccine for prevention and control of influenza: supplemental recommendations of the Advisory Committee on Immunization Practices \[ACIP\]](#)). Children receiving TIV should be administered a dosage appropriate for their age (0.25 mL if 6–35 months or 0.5 mL if  $\geq 3$  years). Children aged  $\leq 8$  years who are receiving influenza vaccine for the first time should receive 2 doses (separated by at least 4 weeks for TIV and at least 6 weeks for LAIV).

Note from NGC and CDC: On October 5, 2004, CDC was notified by Chiron Corporation that none of its influenza vaccine (Fluvirin®) would be available for distribution in the United States for the 2004-05 influenza season. Because of this urgent situation, CDC, in coordination with its Advisory Committee on Immunization Practices (ACIP), issued interim recommendations for influenza vaccination during the 2004-05 season. These interim recommendations were formally recommended by ACIP on October 5, 2004, and take precedence over earlier recommendations. The interim recommendations are available from the [CDC Web site](#).

9. Hepatitis A vaccine: Hepatitis A vaccine is recommended for children and adolescents in selected states and regions, and for certain high-risk groups. Consult your local public health authority (see also the NGC summary [Prevention of Hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices \[ACIP\]](#)). Children and adolescents in these states, regions, and high-risk groups who have not been immunized against hepatitis A can begin the hepatitis A vaccination series during any visit. The two doses in the series should be administered at least 6 months apart.

TABLE. Catch-up immunization schedule for children and adolescents who start late or who are >1 month behind

Catch-up schedule for children aged 4 months–6 years

| Dose 1<br>(minimum<br>age) | Minimum interval between doses              |   |  |                     |
|----------------------------|---|---|--|---------------------|
|                            | Dose 1 to dose<br>2                         | Dose 2 to dose<br>3                             | Dose 3 to dose<br>4                        | Dose 4 to dose<br>5 |
| DTaP (6 wk)                | 4 wk  | 4 wk  | 6 mo                                       | 6 mo <sup>1</sup>   |
| IPV (6 wk)                 | 4 wk  | 4 wk  | 4 wk <sup>2</sup>                          |                     |
| HepB <sup>3</sup> (birth)  | 4 wk  | 8 wk (and 16<br>wk after 1st<br>dose)           |  |                     |
| MMR (12 mo)                | 4 wk <sup>4</sup>                           |   |  |                     |
| VAR (12 mo)                |   |   |  |                     |
| Hib <sup>5</sup> (6 wk)    | 4 wk: if 1st<br>dose given at<br>age <12 mo | 4 wk <sup>6</sup> : if<br>current age <12<br>mo | 8 wk (as final<br>dose): this<br>dose only |                     |

| Dose 1<br>(minimum<br>age) | Minimum interval between doses   |   |  |                     |
|----------------------------|--|---|--|---------------------|
|                            | Dose 1 to dose<br>2  | Dose 2 to dose<br>3   | Dose 3 to dose<br>4  | Dose 4 to dose<br>5 |
|                            | 8 wk (as final dose): if 1st dose given at age 12–14 mo<br>No further doses needed: if 1st dose given at age $\geq 15$ mo  | 8 wk (as final dose) <sup>6</sup> : if current age $\geq 12$ mo and 2nd dose given at age $< 15$ mo<br>No further doses needed: if previous dose given at age $\geq 15$ mo      | necessary for children aged 12 mo–5 y who received 3 doses before age 12 mo                                      |                     |
| PCV <sup>7</sup> (6 wk)    | 4 wk: if 1st dose given at age $< 12$ mo and current age $< 24$ mo<br>8 wk (as final dose): if 1st dose given at age $\geq 12$ mo or current age 24–59 mo<br>No further doses needed: for healthy children if 1st dose given at age $\geq 24$ mo | 4 wk: if current age $< 12$ mo<br>8 wk (as final dose): if current age $\geq 12$ mo<br>No further doses needed: for healthy children if previous dose given at age $\geq 24$ mo | 8 wk (as final dose): this dose only necessary for children aged 12 mo–5 y who received 3 doses before age 12 mo |                     |

Catch-up schedule for children aged 7–18 years

| Minimum interval between doses |                                       |  |
|--------------------------------|---------------------------------------|--|
| Dose 1 to dose 2               | Dose 2 to dose 3                      | Dose 3 to booster dose   |
| Td: 4 wk                       | Td: 6 mo                              | Td <sup>8</sup> : 6 mo: if 1st dose given at age $< 12$ mo and current age $< 11$ y<br>5 y: if 1st dose given at age $\geq 12$ mo and 3rd dose given at age $< 7$ y and current age $\geq 11$ y<br>10 y: if 3rd dose given at age $\geq 7$ y |
| IPV <sup>9</sup> : 4 wk        | IPV <sup>9</sup> : 4 wk               | IPV <sup>2, 9</sup>  |
| HepB: 4 wk                     | HepB: 8 wk (and 16 wk after 1st dose) |  |
| MMR: 4 wk                      |                                       |  |
| VAR <sup>10</sup> : 4 wk       |                                       |  |



Note: A vaccine series does not require restarting, regardless of the time that has elapsed between doses.

1. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP): The fifth dose is not necessary if the fourth dose was given after the fourth birthday.
2. Inactivated polio vaccine (IPV): For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was given at age  $\geq 4$  years. If both OPV and IPV were given as part of a series, a total of 4 doses should be given, regardless of the child's current age.
3. Hepatitis B vaccine (HepB): All children and adolescents who have not been vaccinated against hepatitis B should begin the hepatitis B vaccination series during any visit. Providers should make special efforts to immunize children who were born in, or whose parents were born in, areas of the world where hepatitis B virus infection is moderately or highly endemic.
4. Measles, mumps, and rubella vaccine (MMR): The second dose of MMR is recommended routinely at age 4–6 years, but may be given earlier if desired.
5. Haemophilus influenzae type b (Hib) conjugate vaccine: Vaccine generally is not recommended for children aged  $\geq 5$  years.
6. Hib: If current age is  $< 12$  months and the first 2 doses were PRP-OMP (PedvaxHIB® or ComVax® [Merck]), the third (and final) dose should be given at age 12–15 months and at least 8 weeks after the second dose.
7. Pneumococcal conjugate vaccine (PCV): Vaccine generally is not recommended for children aged  $\geq 5$  years.
8. Tetanus and diphtheria toxoids (Td): For children aged 7–10 years, the interval between the third and booster dose is determined by the age when the first dose was given. For adolescents aged 11–18 years, the interval is determined by the age when the third dose was given.
9. IPV: Vaccine generally is not recommended for persons aged  $\geq 18$  years.
10. Varicella vaccine (VAR): Give 2-dose series to all susceptible adolescents aged  $\geq 13$  years.

### Reporting Adverse Reactions

Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance on completing a VAERS form is available at [www.vaers.org](http://www.vaers.org) or at telephone, 800-822-7967.

### Disease Reporting

Suspected cases of vaccine-preventable diseases should be reported to state or local health departments. Additional information about vaccines, including precautions and contraindications for vaccination and vaccine shortages, is available at [www.cdc.gov/nip](http://www.cdc.gov/nip) or at the National Immunization information hotline, telephone 800-232-2522 (English) or 800-232-0233 (Spanish).

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Effective and age-appropriate administration of vaccines to children and adolescents
- Decline in vaccine-preventable diseases among children and adolescents

#### Subgroups Most Likely to Benefit

Influenza vaccine may be most beneficial for:

- Children aged >6 months with certain risk factors (including but not limited to asthma, cardiac disease, sickle cell disease, human immunodeficiency virus [HIV], and diabetes), healthcare workers, and other persons (including household members) in close contact with persons in groups at high risk
- Healthy children aged 6–23 months and close contacts of healthy children aged 0–23 months because children in this age group are at substantially increased risk for influenza-related hospitalizations

### POTENTIAL HARMS

Not stated

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Staying Healthy

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Centers for Disease Control and Prevention. Recommended childhood and adolescent immunization schedule - United States, July-December 2004. MMWR Morb Mortal Wkly Rep 2004 Apr 30;53(16):Q1-4. [3 references]

Recommended childhood and adolescent immunization schedule--United States, July-December 2004. Pediatrics 2004 May; 113(5): 1448. [PubMed](#)

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2004 Apr 30

### GUIDELINE DEVELOPER(S)

American Academy of Family Physicians - Medical Specialty Society  
American Academy of Pediatrics - Medical Specialty Society  
Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

### SOURCE(S) OF FUNDING

United States Government

### GUIDELINE COMMITTEE

Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP)

### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Not stated

### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

### GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Recommended childhood and adolescent immunization schedule. United States, January-June 2004. Centers for

Disease Control and Prevention. MMWR Morb Mortal Wkly Rep. 2004 Jan 16; 53(1): Q1-Q4.

#### GUIDELINE AVAILABILITY

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- [HTML Format](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

#### AVAILABILITY OF COMPANION DOCUMENTS

None available

#### PATIENT RESOURCES

None available

#### NGC STATUS

This NGC summary was completed by ECRI on February 25, 2004. This summary was updated by ECRI on October 20, 2004 after the Centers for Disease Control and Prevention (CDC) issued interim recommendations in response to the shortage of influenza vaccine.

#### COPYRIGHT STATEMENT

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